



# New Frontiers Planetary Protection Requirements

## Concept Study Kick-off

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# International Agreement on Planetary Protection



Article IX of the Outer Space Treaty of 1967:

- “...parties to the Treaty shall pursue studies of outer space including the Moon and other celestial bodies, and conduct exploration of them so as to avoid their harmful contamination and also adverse changes in the environment of the Earth resulting from the introduction of extraterrestrial matter and, where necessary, shall adopt appropriate measures for this purpose...”

*"Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies."*

*(entered into force, October 10, 1967).*

# Planetary Protection Policy

*Planetary Protection*



It is NASA's policy to:

- Preserve planetary conditions for future biological and organic constituent exploration
- To protect Earth and its biosphere from potential extraterrestrial sources of contamination

# NASA Planetary Protection Documents



- NPD 8020.7 establishes NASA policy for planetary protection, which includes protection of planetary bodies for future exploration and of Earth from extraterrestrial sources of contamination. (Version “F” February 2004)
- NPG 8020.12 is issued to delineate a uniform set of planetary protection requirements for all NASA robotic extraterrestrial missions. Implementation of these requirements will ensure that biological safeguards are being followed in NASA's space programs. (Version “B” April 1999, but version “C” will apply to Moonrise and Juno, due April 2005)
- NPG 5340.1 provides the basic procedures for performing microbial assays for assessing contamination levels of spacecraft. (Version “C” is the working draft)

# Planetary Protection Mission Constraints



- Depend on the nature of the mission and on the target planet
- Depend on current knowledge, based on internal and external recommendations, "but most notably from the Space Studies Board of the National Academy of Sciences"
- Specific measures include:
  - » Reduction of spacecraft biological contamination
  - » Constraints on spacecraft operating procedures
  - » Spacecraft organic inventory and restrictions
  - » Restrictions on the handling of returned samples
  - » Documentation of spacecraft trajectories and spacecraft material archiving

# Planetary Protection

## Mission Categories

(NPG 8020.12B& COSPAR)

Planetary Protection



PLANET PRIORITIES	MISSION TYPE	MISSION CATEGORY
<p>Moonrise</p> <p>A Not of direct interest for understanding the process of chemical evolution. No protection of such planets is warranted (no requirements)</p>	Any	I
<p>Juno</p> <p>B Of significant interest relative to the process of chemical evolution, but only a remote chance that contamination by spacecraft could jeopardize future exploration.</p>	Any	II
<p>C Of significant interest relative to the process of chemical evolution and/or the origin of life or for which scientific opinion provides a significant chance of contamination which could jeopardize a future biological experiment.</p>	Flyby, Orbiter	III
	Lander, Probe	IV
<p>Moonrise</p> <p>All Any Solar System Body</p>	<p>Earth-Return</p> <p><i>“restricted or <b>unrestricted</b>”</i></p>	V

# Compliance with Planetary Protection Requirements



- NASA's Planetary Protection Policy (see NPD 8020.7F and NPG 8020.12B) imposes certain restrictions on mission operations and spacecraft cleanliness
  - Depend on the particular type of mission
- Proposers should:
  - Indicate (i) the anticipated planetary protection Category of the mission under NASA directives; (ii) the proposed mission operational accommodations to comply with the anticipated requirement; and (iii) the proposed steps to be taken for the preparation of the orbital and (if any) landed portions of the spacecraft to comply with the requirements for overall microbiological cleanliness and recontamination prevention prior to launch.
  - If necessary, indicate (iv) the nature of the proposed implementation of back-contamination control and subsequent containment and testing of returned samples, or the proposed rationale for the mission to be relieved from the containment requirement
  - Address the organization(s) responsible for implementing those steps.

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- Proposers should:
  - Write me a letter, providing mission plan and requesting Categorization (you can suggest a Categorization, if you wish)
  - Receive my response, and base Planetary Protection planning for the mission on the Categorization received and agreed to by the Project (formally implemented in the Project's Planetary Protection Plan).



IT NEVER FAILS. I JUST WASHED  
AND WAXED THIS THING.

